

B. Collinson
FIRST EDITION.

DAIRY MILK: 5

ITS DANGERS AND THE REMEDIES.

WITH THE OPINIONS OF

TWENTY EMINENT BRITISH PHYSICIANS

UPON

STERILISED MILK FOR INFANT FEEDING.

BY

CHARLES HENRY LEET

FELLOW OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND;

MEMBER OF THE ROYAL COLLEGE OF PHYSICIANS IN IRELAND;

LATE SURGEON-MAJOR ARMY MEDICAL STAFF.

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Price Twopence. Postage extra.
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To
THE MOTHERS AND NURSES
OF
GREAT BRITAIN AND IRELAND,
THIS LITTLE PAMPHLET
IS DEDICATED BY THE AUTHOR.

THE DIRECTOR-GENERAL ARMY MEDICAL DEPARTMENT, WAR OFFICE
LONDON, WROTE :—

"I shall be happy to bear testimony to your professional efficiency during your service "

"Surgeon C. H. LEET, F.R.C.S., served under me as Surgeon of Royal Engineers at Chatham for some years, where he proved himself a highly efficient medical officer, very popular with the officers and men and their families; showing great zeal and attention to duty, both in hospital and barracks.

" T. W. FOX,

" SURGEON-GENERAL (late R.E.) "

" Mr. LEET was a constant attendant at the Liverpool Royal Infirmary, and lost no opportunity of keeping himself abreast of medical science. He is a man of gentlemanly character and stainless reputation.

" W. MITCHELL BANKS, F.R.C.S. "

INTRODUCTION.

LAST month the Liverpool public was thoroughly aroused by the local press to the necessity of every householder in town, with children or sick persons, adopting the process of domestic sterilisation of their dairy Milk in consequence of the prevalence of its adulteration with water—possibly impure water, and its contamination by Bacteria (Microbes, Micro-organisms) from the manure through the dirty condition of the cow, of the stall, or of the milkers' hands and clothes. The air of the cow-house too is frequently made ins sanitary by cleaning it out and dislodging dirt just previously to milking. Then through uncleanness of the milking vessels Milk has been the carrier of the infection of diphtheria, of typhoid fever, cholera, and foot-and-mouth disease. Last and not least the communicable diseases of the diseased cow itself, as scarlet-fever and tuberculosis (see page 9). Is Nature to blame for this alarming state of the chief food in the community? Certainly not, the Milk flows from the healthy cow's udder fresh, clean, pure, and sterile, absolutely free from all Bacilli, Microbes, &c. But, to be brief, how are these Dangers to be avoided, what are the Remedies? Do the leading English

* "Not more than half the authorities of Lancashire exercise any supervision over cow-sheds."—(Dr. E. Sergeant, M.O.H., Co. Council, Lancashire, Paper in February, 1896).

physicians, especially those in charge of our children's hospitals, recommend the domestic sterilisation of Milk? In reply we have the pleasure to record the result of our letters last month, twenty of these distinguished Physicians—all are strongly in favour of sterilisation, especially for children.

The Remedies are described in the following pages, very few and very simple, such as we have had practical experience of during the past twelve months here in our private Medical Home, viz. We have arranged with our Dairy manager to furnish us with a Sanitary Certificate (see page 9). The consumer's milk jug has been supplanted by the New Sanitary Glass Milk Jar, daily taken away from the hall door and returned full of milk in the afternoon (page 10).

Hawksley's Milk Sterilisers, No. I. and No. II. have been used for humanising, peptonising and sterilising Milk, according to requirements.

We find Hawksley's No. III. Steriliser a valuable improvement on Professor Soxhlet's apparatus; the flat indiarubber discs of the latter, which did not always keep the seven little bottles air-tight when immersed in the *bain marie*, are replaced by rubber valved caps which are quite reliable. Lastly we have had excellent results with Dr. Cathcart's Milk Steriliser, strongly recommended to us as the simplest yet thoroughly reliable apparatus, by Dr. Sims Woodhead (see his letter, page 18).

For daily use along with Cathcart's Patent Steriliser, we have devised a Cooler for Hot

sterilised Milk for Infants, Invalids, &c., in which the Milk that has been sterilised in bulk, as in the Thcart Patent, is immediately transferred to bottles placed under running cold water in our apparatus, restoring the normal taste lost in sterilising, arresting microbic propagation (page 22), and reducing the temperature of the Milk some many degrees in two or three minutes.

In conclusion we beg attention to Sir William Westley's "Recent Observations on Infant Feeding,"* the result of his visit to M. Budin, accoucheur de la Charité, Paris, regretting we have space only for his conclusions in this tiny pamphlet (see pages 18-20).

C. H. LEET.

SYDENHAM,
WATERLOO,
LIVERPOOL,
February, 1896.

* *British Medical Journal*, December 7th, 1895, and also January 4th, 1896.



ROYAL COMMISSION ON TUBERCULOSIS
INFECTIVITY OF TUBERCULOUS MILK.

RESULTS OF
EXPERIMENTS OF DR. SIDNEY MARTIN

(From *British Medical Journal*, 1st Feb., 1896.)

“In all cases in which the udder is affected with Tuberculosis the Milk becomes Tuberculous, and is often extremely virulent,” infecting the butter, buttermilk, and skimmed-Milk. “There is question that this class of Milk ought not to be used as food; it is indeed certain that its exclusion would lead to a great diminution in the large number of cases of Tuberculosis that occur in children.” “The virulence of Tuberculous Milk is extraordinary, much in excess of that shown by Milk which belongs to Meat.” . . . “The Milk of cows with Tuberculosis of the udder ought not to be allowed to be consumed, and such cows ought to be removed from all dairies and slaughtered.”

* Glasgow Town Council Health Committee is memorialised by the Medical Society and Dr. Russell, M.O.H., to enforce its legal powers to eliminate at once all Tuberculous cows in, coming into, Glasgow.—*B. M. Journal*, 15th Feb., 1896, p. 430.

EFFECTS OF COOKING PROCESSES ON TUBERCULOUS MILK: RESULTS OF EXPERIMENTS OF DR. SIMS WOODHEAD AND DR. CARTWRIGHT WOOD.

“Milk from Tuberculous udders is in all cases assessed of the power of setting up Tuberculous infection, even when mixed with a considerable quantity of sound milk. Virulent Tuberculous milk exposed to a temperature of 185° F. for five minutes is sufficient to render the Milk innocuous. *Re Scalding of Milk*:—In scalding the Milk in earthenware jar, a tin pan is placed in another containing a quantity of water, which is then brought to the boiling point, which temperature must be maintained at 212° until 198° has been reached throughout the entire Milk” (continued on page 14).

HOW TO AVOID THE DANGERS OF DAIRY MILK.

THE REMEDIES ARE A. B. C.:—

A. PREVENTION BETTER THAN CURE.

Every dairy manager should furnish his customers each with a * Sanitary Certificate to the effect

* A LICENCE FOR MILK DEALERS.

An amendment to the Sanitary Code of New York City was recently passed requiring all Milk dealers, both wholesale and retail, to provide themselves with a licence. To obtain this they must give the Health Board evidence that their business is conducted strictly in accordance with their rules regulating the Milk supply.—*British Medical Journal*, 15th Feb., 1896.

that the Government Regulations for Dairies and Milkshops are carried out to the satisfaction of the Medical Officer of Health; that an inspection at least monthly by a Veterinary Surgeon of the cows and their food, and a health inspection of every newly arrived cow ("the Tuberculin test, for the presence in the cow of Tuberculosis," being desirable) takes place. That every case of infectious disease amongst the dairy hands is reported at once and isolated. Scrupulous care and cleanliness in handling the Milk, cleansing the cows' udders before milking. Thorough cleanliness of all dairy and Milk shop vessels. That the Milk is fresh and delivered within two or three hours after being milked, not adulterated by water or any foreign matter of any kind, such as chemicals, preservatives. Permission for the family physician to visit the dairy.

I, _____, hereby undertake to carry out the conditions required in the Sanitary Certificate.

Signed,

Dairy.

Date

B. THE GLASS SANITARY MILK JAR.

The dairy Milk passes through about four different vessels before delivery into the consumer's jug. Do the domestics always keep that jug clean?

"There is no control over Dairies," says Prof. Kanthack. See Appendix of Medical Opinions, No. 17, page 27.

is often smeared inside with streaks of stale Milk, harming with microbes! and the innocent dairy folk are blamed by the mistress of the house, whilst the real fault of the Milk "going bad" was the servant's carelessness!

The glass being transparent, any streaks, sediment, admixture of colour, and depth of cream can be seen.

THE GLASS SANITARY MILK JAR. .

"A novel kind of glass jar for delivering milk or cream was exhibited by Mr. C. Melin, to whom a bronze medal was awarded. It consists of a new bottle-shaped jar with wide opening. It is made of pure white flint glass of very heavy substance, well annealed and most unbreakable. The glass stopper used is hinged on by means of a wire, bringing at the neck and most



Address:
37 Crutched Friars &c

ingeniously locked by a movement of the handle. The advantages of this new jar are obvious, as there is no possible danger of contamination by the Milk coming into contact with metal of any kind, whilst the contents of the jar and the quality of the milk can be ascertained at a glance. The appearance of the jar is vastly superior to the ordinary tin can. The jars are made in quart, pint, and half-pint sizes, and specially recommended for the conveyance of nursery milk. This jar seems destined to come into general use, and is certainly worthy the attention of all enterprising dairy-



men."—At "The Dairy Show," 1895, from *The Dairy*, November 15th, 1895.

C. STERILISATION OF MILK.

From Ashby & Wright's "Diseases of Children."

3rd edition, 1896. Published at 25s.

"STERILISATION.—Where milk can be obtained absolutely fresh and uncontaminated from undoubtedly healthy cows, and is consumed at once, sterilising processes are of course unnecessary, but only infants resident in the country, where cows are kept on the premises, can have these advantages. Cow's milk, as it is received by householders in towns, is usually many hours old before it is received, and it may be kept, or at least some portions of it, for twenty-four hours longer before the infant takes it. During this time the bacteria which it has received by means of various contaminations multiply enormously, especially in hot weather. Milk which is acid and "just on the turn" is, it is needless to say, quite unfit for infants' food." Page 49.

"Sterilising for household purposes rests on a somewhat different footing than sterilising in large establishments where the Milk has to keep for many months. The Milk sterilised in the household has only to be kept for twenty-four hours or thereabouts, and therefore so high or continuous a temperature is not required. The success of the sterilising process largely depends upon getting the milk fresh and clean, and consequently containing

few bacteria and no spores. It is impossible in household to sterilise stale Milk." Page 50.

Dr. Sims Woodhead's directions for domestic sterilisation of Milk.—Dr. Woodhead gives the following practical directions for the domestic treatment of Milk when it is desired to arrest souring or when it may be necessary to make use of Milk from an unknown or suspicious source:—" (1) The quantity of Milk should never be more than the quantity of cold water by which it is surrounded it is an advantage, in fact, to have a somewhat larger bulk of water than of Milk, to allow for evaporation. (2) The Milk should not be covered in, and should be stirred from time to time, but the water may with advantage be covered, in order to prevent evaporation; this, of course, is arranged for in special Milk sterilising pans. (3) The water should be boiled over a good brisk flame, in order that the best results may be obtained, and the heating process should be continued until the temperature throughout the Milk has risen to from 88° C. (190° F.) to 92° C. (198° F.); in most cases this takes place at the end of about twenty-five minutes, but in order to be perfectly safe it may be recommended that every quart of milk treated in this fashion should be heated for half an hour, that is, for about twenty minutes after the water in the outer pan has begun to boil " (continued from page 9).

Hawksley's Patent Milk Sterilisers. Nos. I. and II. are well-known. (See Introduction).

Hawksley's No. III. Steriliser is only just patented. It corrects the disadvantages of Soxhlet's Apparatus, by using reliable red rubber

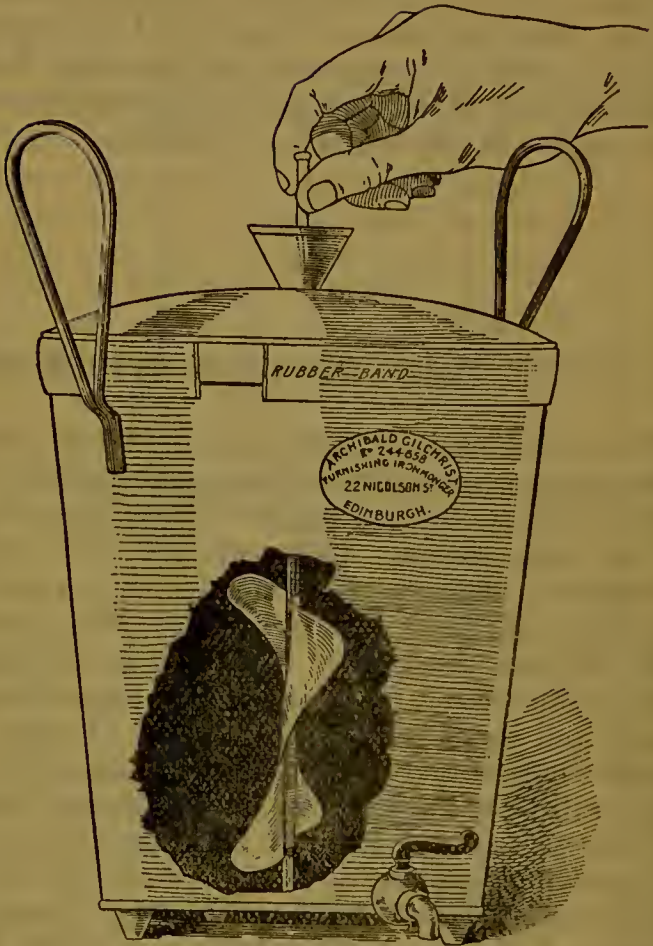
valved caps, in lieu of the latter's flat India-rubber discs, which are not always air-tight on the bottles. In other respects the Hawksley is almost identical with the Soxhlet Patent. Nearly all the physicians in their replies recommend to use the Soxhlet Steriliser, and Hawksley uses Professor Soxhlet's seven bottles in his No. III. Apparatus.

A SIMPLE FORM OF MILK STERILISER.

The sterilisation of Milk intended for the feeding of infants presents many advantages, especially when dealing with the milk supplied in the poorer quarters of large towns. Unfortunately, the form of apparatus generally recommended, in which the quantity of Milk, or of the selected Milk mixture, used for each feeding is sterilised in a separate bottle, demands a greater initial expenditure of money and continuous expenditure of time and trouble than mothers of the poorer classes are commonly willing to incur. The accompanying illustration shows a simple form of apparatus for sterilising the whole quantity of Milk required for the day. It was exhibited and described by Mr. Charles W. Cathcart, F.R.C.S., Assistant-Surgeon to the Royal Infirmary, Edinburgh, before the Section of Diseases of Children at the last annual meeting of the Association, and has already been mentioned briefly in our report of the proceedings of that Section.

—*British Medical Journal*, 4th January, 1896.

CATHCART'S MILK STERILISER.



“The apparatus consists of a tin vessel of about 60 oz. capacity, furnished with a nickel-plated draw-off cock. The lid, which fits on to an inner rim, is flush with the outer surface, and is provided with a

small funnel in the centre. To prevent the cream from accumulating on the top there is a stirring apparatus, consisting of a rectangular piece of metal bent so as to resemble a screw propeller, with a handle which projects through the funnel in the lid far enough to be rotated by the forefinger and thumb.

The apparatus fits easily into a No. 7 pot or sauce pan, which size of pan will be found in almost every house."

DIRECTIONS FOR USE.

"Remove rubber band and lid; rinse out the vessel with boiling water, then pour in the quantity of Milk food required for twenty-four hours. Place the vessel in the pot, which should be about a quarter full of boiling water, and allow it to remain there for twenty minutes, during which time the pot should be kept boiling over a good fire. Then remove the vessel from the pot, spring the rubber band over the lid where it joins the vessel, and place a plug of clean *cotton wool on the top of the funnel—round the handle of the stirrer. Keep the vessel containing the now sterilised milk food in a cool place, and

*We find pure wool-wadding better. The stirring rod should be furnished with a removable handle for rotating it, as the cotton wool gets displaced, and microbes from the fingers contaminate the rod and Milk. In Escherlich's Apparatus, of which Cathcart's is a modification, there is a valved opening for admitting air, likewise guarded with wool wadding and regulated by a stopcock.

In the case of Infant feeding *all the hot sterilised Milk* is drawn off *at once* into feeding bottles in our Cooler, so this weak point is avoided altogether.

draw off into the feeding-bottle from the stop-cock as required, having previously stirred the contents of the vessel by rotating the projecting rod."

This apparatus is made by Mr. Gilchrist, 2 Nicholson Street, Edinburgh, by whom it is sold. Can also be obtained from Down Brothers, 8 Thomas Street, Borough, London.

Dr. Sims Woodhead (Director Research Laboratory Consulting Board, R.C.P., Lond., and R.C.S., Eng.), writes to us, January 4th:—"Dr. Cathcart's Milk Steriliser is, I know from actual experience, an excellent piece of apparatus, practical and simple. I certainly recommend half an-hour as the time to leave in the Milk, stirring it thoroughly two or three times during this period. The stirring arrangement is exceedingly simple and thorough, so that I do not think you need be afraid that the Milk will not be mixed during the process of heating. Milk treated in this way is absolutely free from pathogenic germs, and may be given to children with perfect safety. The Milk is not in bottles, but directly in contact with a large metal surface. Twenty minutes from the water coming up to boiling point is what I should recommend."

Sir William Priestley's "Recent Observations on Infant Feeding," (see introduction, page 7). The concluding extracts from this valuable paper:—

"The Académie de Médecine in Paris does not think it beneath its dignity to express an opinion on babies' feeding-bottles, because it concerns a matter of vast importance to the community, and it has emphatically condemned all feeding-bottles with long and complicated tubes, because it is impossible to keep them clean and sterilised. Consequently

they become the nidus for bacterial development, particularly at the joints. The simplest bottle, which can be scalded throughout, is the best, but there may be great difficulty in persuading poor women to adopt them, because although a siphon bottle may be the means of poisoning her baby, yet she can put it beside the child in its cot and go about her other occupations, leaving it to absorb its nourishment automatically.

To sum up M. Budin's conclusions, therefore, we may say:—

1. That he regards breast milk as absolutely the best and safest nourishment for an infant, and that when a mother cannot nurse her own child the best substitute is a good wet nurse.

2. When artificial feeding must be had recourse to, cows' or another animal's Milk sterilised by the method alluded to is by far the best substitute, but even when milk has been sterilised it must be guarded by certain precautions, and the simplest feeding bottle is the best.

3. Sterilised Milk is best given undiluted with water, the quantity given to vary with the age of the child and other circumstances.

This, I presume, implies that the child is in normal health. If any derangement of the digestive organs or other abnormal condition is present, attention with barley water or other modification of food, may be required as well as medicines.

He objects to all farinaceous forms of food during the first year of life.

The method of sterilisation of Milk as recommended by M. Budin is not new, and he does not claim any originality in this respect. Inexpensive

apparatus for this purpose is to be found with many instrument makers. I learned quite lately that the calves used for vaccination at the National Vaccination Institution are now fed on sterilised Milk to keep them healthy. It would certainly be a satire if we were not to adopt the same measures of safety for human beings which we provide for the lower animals.

M. Budin insists that both in hospital and private practice the progressive well-being in the infant is best ascertained by weighing it. In his hospital the children are weighed every day, and their weight is registered, so that an increase or diminution is readily observed. He has constructed an ingenious table which serves as a register. In the first column are figures in grammes, the lowest ones at the bottom with an ascending scale. The days and weeks are indicated along the top, and thus a curve may be traced with pen or pencil, as in temperature chart. Even under normal circumstances the weight of the child drops a little during the first week after birth, but after that time it ought steadily to advance. In the charts alluded to, whenever water was added to the Milk there was always a little drop in the curve, showing that less nourishment had been absorbed, and a like drop was noticed if, perchance the child had diarrhoea, or catarrh, or other infantile ailment, showing that nutrition was impaired."

We British physicians have learned that the *weight*, and not the age of the infant, should determine the quantity, &c., of the food. Hawksley's Pese Béb  or Weighing Machine will be handy and help us to follow M. Budin's zeal.

LEET'S COOLER FOR HOT STERILISED MILK FOR INFANTS.

A simple, practical apparatus for immediate and thorough cooling-down of the sterilised Milk at the completion of the process of sterilisation in the Cathcart patent *, has been felt in our Medical Home absolutely necessary to safeguard this valuable sterile milk on its perilous voyage from the boiling Cathcart stop-cock to the infant's mouth (every four hours for twenty-four hours Milk supply).

Our apparatus consists of a covered tin vessel. The inlet aperture on one side conveys, by an India-rubber tube, a stream of running water from the house water tap into the vessel, the water passing out by the outlet aperture in the opposite wall of the vessel. A sufficient number of feeding bottles filled with the hot sterilised Milk, and fitted with air-tight black rubber teats, † are arranged in sockets inside the vessel, and the running cold water soon reduces the temperature to that of the water—a fall of about fifty degrees. In Summer for infants, and at any time for adults with gastric troubles, the Cooler can become a refrigerator for Milk or Milk foods. The Cooler renders sterilised Milk more palatable—more aroma, no burnt taste. Again, warm Milk, from its remarkable capacity for heat, parting with it much more slowly than does hot water, suffers from

* Or "The Domestic Steriliser" (Aymard's Patent). Agents: Town Bros., 5, St. Thomas's Street, London, S.E.

† Teats without holes.

changes in itself which would be injurious to infant life, but the Cooler arrests all such evils for twenty-four hours at least.

Lastly, the Cooler minimises the risk of microbic contamination from without, en route to the infant's mouth, whereas the Cathcart vessel is at the mercy of every inquisitive nurse-girl's disturbing the cotton-wool whilst twirling the stirring metal rod, that microbes may freely gain access to the happy hunting grounds below; can she be trusted to use every four hours a sterile feeding bottle and teat in a badly ventilated kitchen with an average temperature of 63° ? she can tamper with the Milk, add impure water, drink it, &c.

Should this feeble attempt to aid in reducing the lamentable infantile death rate succeed, and lead to the more general use of Sterile Milk in the gastric troubles of consumptives and others, we shall leave the world by and by physically better than we found it. (*Sterilised*)

Milk by being thus rapidly cooled down escapes the formation of Scum (Skin) that collects on sterilised milk as it slowly cools in all milk Sterilisers advertised.

APPENDIX.

PINIONS OF TWENTY EMINENT BRITISH PHYSICIANS UPON THE SUBJECT OF STERILISED MILK FOR INFANTS.

1.—Sir Dyce Duckworth, Physician to St. Bartholomew's, London:—"There is an excellent form of Milk Steriliser, known as Professor Soxhlet's. There are now one or two Milk companies here which send out Sterilised Milk daily at 5d. per quart. The working of the steriliser is very simple, and the advantages very great. If you do not know it I would advise you to read Sir W. Priestley's address on the subject, *British Medical Journal*, December 7, 1895."

2.—Dr. Barlow, Physician, Hospital for Children, Great Ormond Street, W.C.:—"The steriliser I have used is Soxhlet's, which is satisfactory. Hawksley has been working at a simplification. I am not convinced, however, that simple scalding of the Milk by one pan enclosed in another is not adequate. I am sure the storing of sterilised Milk is a bad thing."

3.—Dr. Cheadle, Physician to Hospital for Children, Great Ormond Street, W.C.:—"I do not advise Sterilised Milk as a regular or permanent food for infants, for I am not sure that its vital

properties (antiscorbutic and other) are not impaired by the prolonged heating—scurvy results in some cases. It is excellent for temporary use in cases of difficult digestion, or in travelling, &c. It should, however, be replaced before long by Milk merely boiled by a process of gradual substitution by mixing. The only apparatus with which I am acquainted is Soxhlet's, but I believe Hawksley, of Oxford Street, has an improved form."

4.—Dr. Ewart, Physician to Belgrave Hospital for Children, S.W.:—"I regard Sterilised Milk as of great value for infants deprived of Mother's Milk. *Its more general use would doubtless lead to a diminution in the death rate.*"

5.—Dr. Cautley, Physician to ditto:—See No. 15.

6.—Dr. Eustace Smith, Physician to East London Hospital for Children:—"The best Milk Steriliser is Soxhlet's."

Dr. Dawson Williams, Physician to ditto:—No reply.

7.—Dr. W. S. Playfair, Physician Eveline Hospital for Children, S.E.:—"I am very sorry that I have never had occasion to use Sterilised Milk, and have no experience of it."

8.—Dr. J. F. Goodhart, Physician to ditto:—"Soxhlet's is, I think, as good as any. It is simple, complete, handy, and cheap."

9.—Dr. T. Lauder Brunton, Physician Paddington Green Children's Hospital, W.:—"I regret to say that I have no experience whatever of Sterilised Milk in the feeding of infants, but a friend of mine, who sees many children, has had

very great success in its use. The sterilisation, however, must be thoroughly effected."

10.—Dr. Ridge Jones, Physician Victoria Hospital for Children, Chelsea:—"Considers *fresh* Sterilised Milk essential for town children."

11.—Sir Charles Cameron, M.D., Medical Officer of Health, Dublin:—"The only way to thoroughly sterilise Milk is to boil it for five minutes. This will kill both bacilli and their spores; the former will be destroyed by keeping the milk at a temperature of 170° for a few minutes. It is rarely that Milk so treated would be likely to contain virulent organisms. I am not much in favour of purchasing Milk said to be sterilised, it is so easy to do the process for oneself.

. . . I do not believe in the filtering of Milk to take organisms out of it."

12.—Dr. Vacher, F.C.S., M.O.H. Cheshire County Council:—"The great point in an apparatus for sterilising Milk is to have something simple in design, and to be kept scrupulously clean. The one reported on in the *British Medical Journal*, 4th January, 1896, is simpler and cheaper than most sterilisers. You must impress upon the housewife using it the need of *infinite cleanliness*. You can get in Liverpool Sterilised Milk guaranteed to be free from tuberculous taint."

13.—Dr. Caton, Physician, Liverpool Royal Infirmary, and Infirmary for Children:—"Soxhlet's Milk steriliser is the best for infants. For adults, Hawksley's steriliser is more convenient."

Dr. Peter Davidson, Physician, Infirmary for Children, Liverpool:—"Soxhlet's is the best I have seen."

Dr. Wm. Carter, Physician, Royal Southern Hospital:—"Dr. Carter is unable to advise Dr. Leet in the matter concerning which he writes."

14.—Dr. Sidney Martin, Assistant Physician University College Hospital:—"I consider it of the highest importance that *Milk should be sterilised before being taken by infants or adults*. Simple boiling in a saucepan is of course the most rapid method of sterilising Milk, and not actually boiling for more than a minute, but the Milk tastes better when sterilised in a water bath, and the time you mention, viz., 40 minutes, is effectual; the Milk is thus thoroughly steamed. I constantly use sterilised Milk prepared quickly in a clean bottle immersed in a large saucepan, &c."

15.—Dr. Edmund Cautley, Physician to Belgrave Hospital for Children, S.W.:—"I am quite convinced that in towns, such as London and Liverpool it is very dangerous to give unsterilised Milk to infants. As a means of sterilising I find simple boiling efficacious; it is quite sufficient for the destruction of pathogenic organisms, including the tubercle bacillus. To ensure complete destruction of all organisms, and their spores, a more prolonged exposure to a higher temperature is necessary, and for this purpose I make use of Soxhlet's apparatus, as per enclosed. The prolonged heat renders the Milk less nutritious and deprives it of its anti-scorbutic properties. Simple boiling is quite sufficient for Milk given to adults. You will find a paper in the *St. Bartholomew's Hospital Journal* for October, 1895, published by Adlard & Co., Bartholomew Close, price 6d., and a paper in the *Lancet*, January 11th, 1896, on a

Special Milk for infants; in these you may find some hints for your paper, of which I should be pleased to have a copy, if you have it printed."

16.—Dr. Hellier, Leeds, author of "*Infant Rearing*:"—"I think children thrive very well on sterilised Milk. Only for very young infants I prefer to begin with "*Humanised Milk*" (only I have no experience of feeding infants with sterilised Milk *undiluted*, as Budin and Priestley advocate. I am not converted to that view). I think Soxhlet's apparatus (Maw & Son), is as good as any. I have tried it myself. I have made a Nurses' and Students' textbook on this subject. ("*Infant Rearing*:" C. Griffin & Co., 3s.) If you care to look into that you will find pretty much all I know on the question. The only doubt is whether a long continued use of sterilisation might cause the diet to be deficient in antiscorbutics; but this can be got over by the occasional use of whey, meat extract, &c."

17.—Professor A. A. Kanthack, author of "*Handbook of Practical Bacteriology*," writes 31st Dec. :—"There being no control over dairies, I think, for children, sterilisation of Milk is necessary, but this should be done in a *bain marie*. Simply boiling milk over the fire is quite inefficient, and so is scalding."

18.—Professor S. Monckton-Copeman, Medical Inspector, Local Government Board, writes to the same effect: that the sterilisation must be "skillfully carried out."

19.—Dr. Thorne Thorne, C.B., Principal Medical Officer to the Local Government Board:—Cows through their Milk can communicate to man a

disease similar to scarlet fever, and also diphtheria; the latter dangerous in Milk that is stored,* the bacilli multiplying by millions! Tuberculous milk cows transmit tubercle through their uncooked Milk to infants, always when the cow's udder is tuberculous. Impossible to detect the latter without tuberculin test. Regarding the heavy mortality amongst infants and children from Tuberculosis Dr. Thorne insisted upon cooked (sterilised thoroughly) Milk for all children. **Lecture at National Health Society, 14th January, 1896.*

20.—Sir William Priestley:—"To make the sterilisation of Milk effective, great care must be taken to exclude every source of infection from germs which may get access to the Milk after the process is completed, either in the vessels themselves or in the apparatus used for feeding. Many of the misadventures were found to arise from lack of precaution in this respect. Sometimes the Milk, after being duly sterilised, was again exposed for some time to the air before being used, and thus became again the medium for development of bacteria, more especially in a warm atmosphere."

* * * * *

"If pathogenic organisms can be prevented getting access to the digestive organs of young children, one of the most fertile sources of infantile diarrhoea would be removed and the mortality from this cause greatly lessened.

Sterilised Milk seems in certain cases actually to be a remedy for infantile diarrhoea, for always supposing that a fresh supply of irritating organisms is not poured continuously into the digestive

nal, Nature will eliminate the poison up to a certain amount, and then untainted Milk is re-ned and becomes nutritious.”—Extracted from Dr. William’s paper (see Introduction, page 7).

N.B. — These valuable “Opinions,” chiefly brief replies on the post cards enclosed to each of these eminent medical men, politely requesting the name of the Milk Steriliser they recommend, are now published upon the grounds of the “present stress,” when the purveyor of “Dairy Milk” can defy the laws, and poison hundreds of British children by the *dirty, diseased, and watered compound he dares to call “Fresh New Milk.” Is the family physician to look on at all this and take no steps for prescribing physic that does not, cannot kill, the poisonous Milk? We affirm that the public must take the law into its own hands, insist upon the Sanitary Certificate we suggest, and obtain from some philanthropic physicians daily fresh sterilised Milk,† avoiding the foreign Condensed Milks which may be just as contaminated as our own, and those English Sterilised Companies which never should supplant the clean, fresh Milk of the honest English dairyman.

* The *British Medical Journal* Commission on the London Milk Supply, last August, found in every sample the *Bacillus Coli communis*—the Manure Microbe, in consequence of faecal contamination. (See the *Journal*, 31st August, 1895.)

† If too nervous to undertake domestic sterilisation daily of their dairyman’s Milk supply.

POSTSCRIPT.

Dr. Ashby, President, Medical Society, Manchester.

The President, in his address on Milk and Infantile Disease, 5th February, 1896, dwelt on the fact that much of the Milk supplied to our large cities was unfit for feeding infants. This was chiefly the result of the careless handling of the Milk so that it contained numerous micro-organisms and also on account of the bad feeding of the cows. As a result, condensed milk and various kinds of preserved milks were used, which, though useful as temporary resorts, were unfit for continuous use as infant foods.—*British Medical Journal*, 15th Feb. 1896.

